

CLAIMS

- 1 1. An optical system comprising:
- 2 an optical filter having an optical filter component and a tuning assembly, said
- 3 optical filter defining an optical path;
- 4 said optical filter component having a propagation axis, said optical filter
- 5 component exhibiting a length of physical path along said optical path of said optical
- 6 filter, said optical filter component being adapted to receive an optical signal such
- 7 that, in response to the optical signal, said optical filter component propagates at least
- 8 a first frequency of light;
- 9 said tuning assembly engaging said optical filter component, said tuning
- 10 assembly being adapted to alter said length of said physical path of said optical filter
- 11 component along said propagation axis such that said optical filter component
- 12 propagates at least a second frequency of light in response to the optical signal, the
- 13 second frequency of light being different from the first frequency of light.
- 1 2. The optical system of claim 1, wherein said tuning assembly includes a
- 2 housing, said housing at least partially encasing said optical filter component.

1 3. The optical system of claim 2, wherein said tuning assembly includes a
2 retaining member adjustably engaging said housing; and
3 wherein said optical filter component is arranged between said retaining
4 member and at least a portion of said housing such that adjusting a position of said
5 retaining member relative to said housing can change said length of said physical path
6 of said filter component along said propagation axis.

1 4. The optical system of claim 3, wherein said housing defines a cavity and an
2 opening, said cavity optically communicating with said opening, said opening being
3 adapted to receive the optical signal; and
4 wherein said filter component is arranged within said cavity.

1 5. The optical system of claim 4, wherein said tuning assembly includes a force-
2 compensating member, said force-compensating member being arranged within said
3 cavity between said retaining member and at least a portion of said housing, said
4 being adapted to expand to apply a compressive force to said optical filter component.

1 6. The optical system of claim 5, wherein said force-compensating member is
2 formed of a piezoelectric material and is adapted to expand in response to an applied
3 voltage.

1 7. The optical system of claim 5, wherein said force-compensating member is
2 formed of a material exhibiting a coefficient of thermal expansion selected to
3 substantially maintain the compressive force applied to said optical filter component
4 when said optical filter deforms in response to a change in temperature.

1 8. The optical system of claim 5, wherein said force-compensating member is
2 annular in shape.

1 9. The optical system of claim 5, wherein said tuning assembly is adapted to
2 compress said optical filter component to decrease said length of said physical path.

1 10. The optical system of claim 1, wherein said tuning assembly includes a
2 housing and a first force distribution member, said housing defining a cavity and an
3 opening, said cavity optically communicating with said opening, said opening being
4 adapted to receive the optical signal, said optical filter component being arranged
5 within said cavity, said first force distribution member arranged within said cavity
6 between said opening and said optical filter component, said first force distribution
7 member being configured to transmit compressive force substantially uniformly to
8 said optical filter component.

1 11. The optical system of claim 10, wherein said first force distribution member is
2 more rigid than said optical filter component.

1 12. The optical system of claim 10, wherein said first surface of said first force
2 distribution member is substantially planar.

1 13. The optical system of claim 1, wherein said tuning assembly is adapted to
2 tension said optical filter component to increase said length of said physical path.

1 14. The optical system of claim 1, wherein said optical filter is an optical bandpass
2 filter.

1 15. An optical system comprising:
2 an optical filter defining an optical path, said optical filter having an optical
3 filter component, said optical filter component having a propagation axis, said optical
4 filter component exhibiting a length of physical path along said optical path of said
5 optical filter, said optical filter component being adapted to receive an optical signal
6 such that, in response to the optical signal, said optical filter component propagates at
7 least a first frequency of light; and
8 means for altering said length of said physical path of said optical filter
9 component along said propagation axis such that said optical filter component
10 propagates at least a second frequency of light in response to the optical signal, the
11 second frequency of light being different from the first frequency of light.

1 16. A method for tuning an optical filter, the optical filter defining an optical path
2 and being adapted to propagate an optical signal along the optical path, said method
3 comprising:

4 providing an optical filter component having a propagation axis;

5 arranging the optical filter component along the optical path, the optical filter
6 component exhibiting a length of physical path along the propagation axis, the optical
7 filter component being adapted to receive the optical signal such that, in response to
8 the optical signal, the optical filter component propagates at least a first frequency of
9 light along the optical path; and

10 altering the length of the physical path of the optical filter component along
11 the propagation axis such that the optical filter component propagates at least a
12 second frequency of light along the optical path in response to the optical signal, the
13 second frequency of light being different from the first frequency of light.

1 17. The method of claim 16, wherein altering the length of the physical path along
2 the propagation axis includes decreasing the length of the physical path.

1 18. The method of claim 17, wherein the length of the physical path is decreased
2 by compressing at least a portion of the optical filter component.

1 19. The method of claim 16, wherein altering the length of the physical path along
2 the propagation axis includes increasing the length of the physical path.

1 20. The method of claim 19, wherein the length of said physical path is increased
2 by placing at least a portion of the optical filter component under tension.

1 21. The method of claim 16, further comprising:
2 tilting the filter component so that the propagation axis of the filter component
3 and the optical path are not parallel.

1 22. A method for propagating an optical signal along an optical path comprising:
2 providing a first material;
3 arranging the first material along the optical path, the first material exhibiting
4 a length of physical path along the optical path;
5 receiving an optical signal at the first material; and
6 altering the length of the physical path to alter a characteristic of the optical
7 signal by at least one of compressing and tensioning the first material.

1 23. The method of claim 22, wherein the first material forms at least a portion of
2 an optical bandpass filter.

1 24. The method of claim 23, wherein, in altering the length of the physical path, a
2 center frequency of the optical bandpass filter is altered.

1 25. The method of claim 24, wherein altering the length of the physical path is
2 accomplished to reduce drift of the center frequency.